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Plasma reactor and process for very fast etching of silicon or epoxy resins in which a wafer is placed on a pedestal in a chamber, gas is exhausted from the chamber through a pressure regulation valve, a gas containing fluorine and/or oxygen is introduced into chamber through a showerhead electrode which is positioned substantially parallel to and less than 6 mm from the pedestal, RF power is applied to the pedestal and/or the showerhead electrode, and the pressure inside the chamber is maintained at a level greater than 1.5 Torr.